July 9, 1929. K. T. POTTHOFF 1,720,525

APPARATUS FOR TREATING PIPES, BARS, ETC

Original Filed April 18, 1925

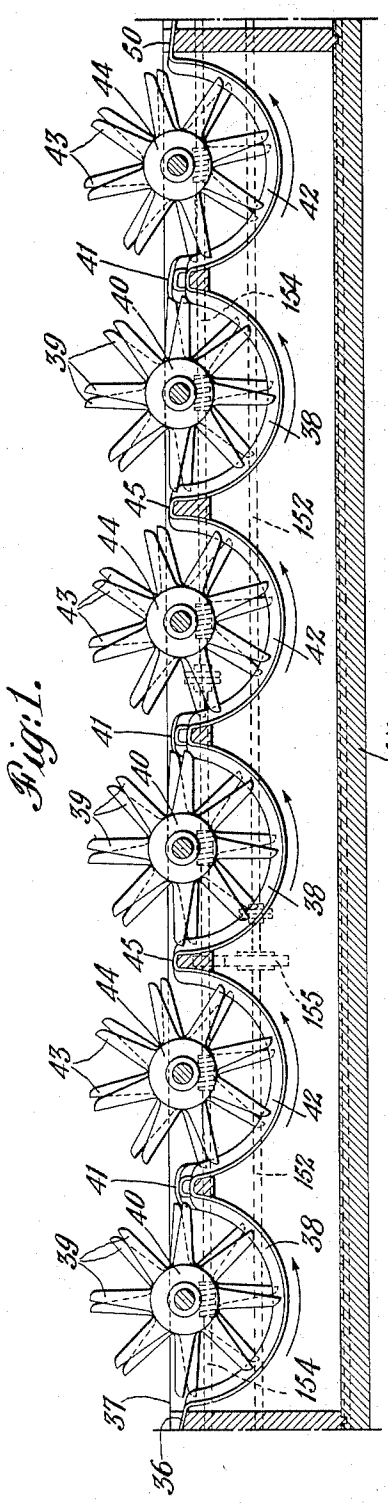


Fig. 1.

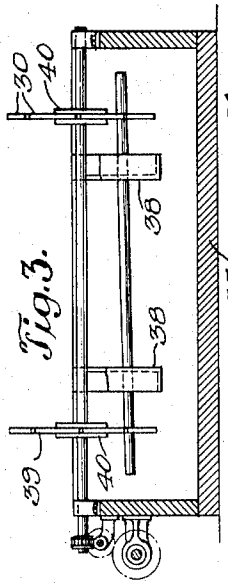


Fig. 3.

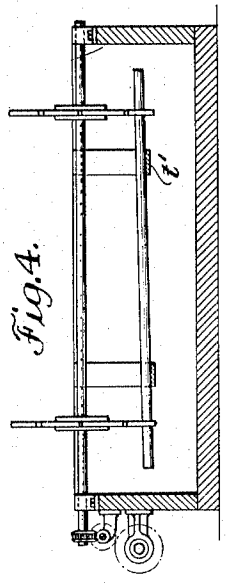


Fig. 4.

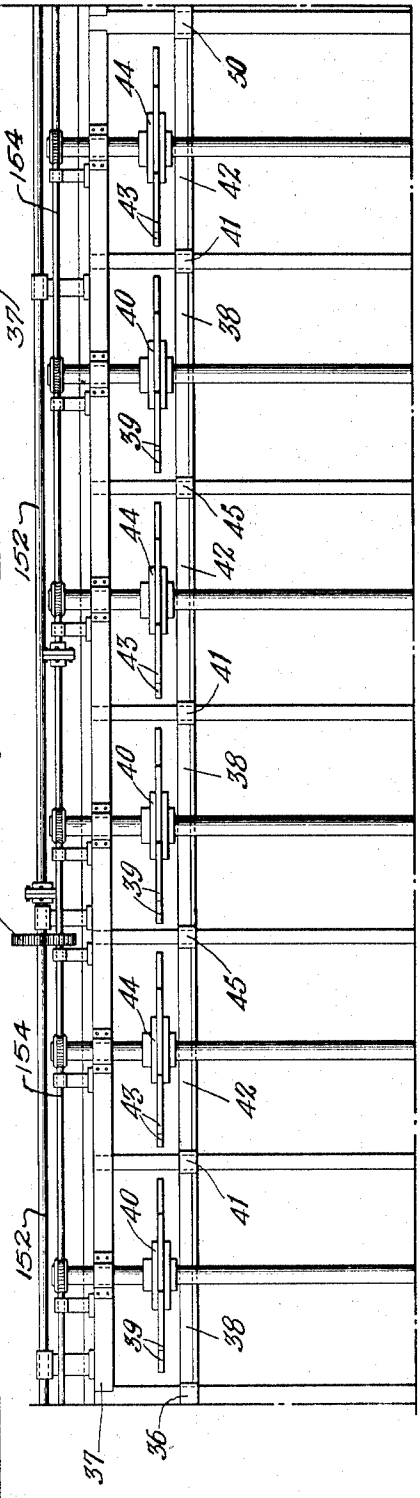


Fig. 2.

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APPARATUS FOR TREATING PIPES, BARS, ETC.

Original application filed April 18, 1925, Serial No. 24,053. Divided and this application filed December 6, 1927. Serial No. 238,004.

This invention relates to an apparatus for cleaning and pickling articles and particularly to the cleaning and pickling of a tubular article such as a pipe.

The object of the invention is to provide an apparatus which will automatically prepare the pipes for coating, passing the pipes through the operation so that uncoated pipes are received at one end of the apparatus and are delivered cleaned and pickled at the other end.

Further objects of the invention will appear from the following description taken in connection with the accompanying drawings, in which

Fig. 1 is a sectional elevation of an apparatus adapted to carry out the invention.

Fig. 2 is a plan view of an apparatus shown in Fig. 1.

Figs. 3 and 4 are sectional views illustrating the alternative methods of conveying and tipping the pipe.

The pipes to be treated are delivered from a rinsing tank which removes all cleaning liquid and rolled down incline 36 into a treating liquid 37 such as an acid both for "pickling" the pipes by chemical action removing scale and renewing the surfaces of the pipe preparatory to receiving a coating material. I have found it important to make the action of such a solution even and thorough particularly within the pipe. To attain this the solution within the pipe is constantly renewed so as not to become weakened and irregular in its action. Each pipe on rolling down incline 36 and semicircular tracks 38 is received by the arms 39 of spiders 40, these spiders being angularly offset as shown so that (viewed in endwise projection Fig. 1) the arms 39 at one end of the pipe are out of register with the arms at the other end. As the pipe passes down into the liquid one end of the pipe is thus higher than the other and the liquid will naturally tend to circulate thoroughly in the interior of the pipe displacing any air bubbles and the like and completely filling the pipe.

As the pipe reaches the lowermost portion of tracks 38 its ends are substantially at the same level and then as the following arms engage the pipe to lift it up along the tracks 38 the previously lower end is gradually raised above the other end so as to again provide for a natural circulation and the renewal of the solution and the removal of any accumulated air bubbles. The raised end of the pipe will pass out of the liquid 37 and the interior liquid will of course flow down toward the lower end and the entire pipe in inclined position will be raised out of the liquid so as to drain off the solution from the interior of the pipe. The pipe thus inclined is passed on to the correspondingly inclined support 41 across which it rolls to the semicircular tracks 42 where it is received by the arms 43 of spiders 44. These spiders 44 are offset with relation to each other in a direction opposite to the offset of the spiders 40 so that the inclination of the pipe at the entrance portion of the tracks 42 is opposite to the inclination at the entrance portion of tracks 38. The pipe is thus carried down along the tracks 42 with its near end (Fig. 1) below the other end with the same advantageous natural circulation of the pickling liquid. Similarly at the bottom of tracks 42 the following arms 43 pick up the pipe and gradually reverse its inclination and carry it in inclined position up the discharge portion of tracks 42 draining it in a direction opposite to the previous draining and delivering the pipe to the inclined support 45 where it is deposited with its near end (Fig. 1) higher than its far end.

These conveyor units each alternately submerging the inclined pipe in the solution and lifting it in oppositely inclined positions are repeated in the tank 47 to subject the pipe to the action of the solution a desired number of times. In the apparatus shown there are six of these units.

Fig. 3 is a sectional view showing the tipping of the pipe by the offset of the rotatable conveyor arms on opposite sides with relation to each other, and Fig. 4 is a similar section showing the pipe tipped by having one of the conveyor tracks t' at a higher level than the other, the conveyor arms in such case not necessarily being offset with relation to each other. It is obvious that still other means may be employed to give inclination to the pipe as it is passing through the liquid.

The raw pipes received in at one end of the apparatus are thus cleaned and pickled on the inside and outside and delivered in perfect cleaned and pickled condition at the dis-

charge end. While the above description is directed mainly to the treatment of tubular articles such as pipes, it is obvious that the apparatus may be equally well used in connection with other elongated articles such as bars, molding strips and the like, it being only necessary to correspondingly change the apparatus and for articles which will not roll to arrange the positive feeds to pass the articles from one feed to the other instead of interposing an inclined draining portion between the feeds as shown. It is obvious that one or more of the operations may be omitted where not desired or required and that various modifications of the apparatus may be resorted to within the scope of the invention and without departing from the novel combination set forth in the appended claims.

This application is a division of applicant's copending application Serial No. 24,053 filed April 18, 1925, for method and apparatus for treating pipes, bars, etc.

I claim:

1. In apparatus for treating tubular articles, the combination with a tank adapted to contain liquid, of means for feeding the articles through said tank and renewing the liquid within the interior of the article in alternate opposite directions during its progress through said tank.

2. In apparatus for treating tubular articles, the combination with a tank adapted to contain liquid, of means for feeding the articles through said tank and repeatedly renewing the liquid within the interior of the article in alternate opposite directions during its progress through said tank.

3. In apparatus for treating tubular articles, the combination with a tank adapted to contain liquid, of means for feeding the articles through said tank and renewing the liquid within the interior of the article during its progress through said tank by inclining the article in alternate opposite directions.

4. In apparatus for treating tubular articles, the combination with a tank adapted to contain liquid, of means for feeding the articles through said tank and renewing the liquid within the interior of the article during its progress through said tank by inclining the article at changing inclinations.

5. In apparatus for treating tubular articles, the combination with a tank adapted to contain liquid, of means for feeding the articles through said tank and renewing the liquid within the interior of the article during its progress through said tank by inclining the article at changing inclinations in opposite directions.

6. In apparatus for treating tubular articles, the combination with a tank adapted to contain liquid, of means for feeding the articles through said tank and renewing the liquid within the interior of the article during its progress through said tank by lifting the end of the article above the surface of the liquid.

7. In apparatus for treating tubular articles, the combination with a tank adapted to contain liquid, of means for feeding the articles through said tank and renewing the liquid within the interior of the article during its progress through said tank including means for lifting the end of the article above the surface of the liquid and then lifting the entire article above the surface of the liquid and then re-submerging the article in the liquid.

8. In apparatus for treating tubular articles, the combination with a tank adapted to contain liquid, of means for feeding the articles through said tank and renewing the liquid within the interior of the article during its progress through said tank including means for lifting the end of the article above the surface of the liquid and then lifting the entire article above the surface of the liquid and then re-submerging the article in the liquid in inclined position.

9. In apparatus for treating tubular articles, the combination with a tank adapted to contain liquid, of means for feeding the articles through said tank and renewing the liquid within the interior of the article during its progress through said tank including means for lifting the end of the article above the surface of the liquid and then lifting the entire article above the surface of the liquid and then re-submerging the article in the liquid in inclined position and repeating the process with opposite inclination of the article.

10. In apparatus for treating tubular articles, the combination with a tank adapted to contain liquid, of means for feeding the articles through said tank and renewing the liquid within the interior of the article during its progress through said tank including means for lifting the end of the article above the surface of the liquid and then lifting the entire article above the surface of the liquid and then re-submerging the article in the liquid in inclined position, and repeating the process with alternating opposite inclinations of the article.

11. In apparatus for treating pipes, bars and the like, the combination with a tank adapted to contain liquid, of means for feeding the article through said tank including means for supporting it in an inclined position while passing through a part of said tank and in a reversely inclined position while passing through another portion of the tank.

12. In apparatus for treating pipes, bars and the like, the combination with a tank adapted to contain a liquid, of means for conveying the article through the tank and supporting the article inclined in one direc

tion at one portion of the tank and inclined in the opposite direction at another portion of the tank.

13. In apparatus for treating pipes, bars and the like, the combination with a tank adapted to contain liquid, of means for feeding the article through said tank and supporting it at different intervals in oppositely inclined positions while passing through said tank, said means being adapted to raise one end of the article above the surface of the liquid at a portion of the tank.

14. In apparatus for treating pipes, bars and the like, the combination with a tank adapted to contain a liquid, of means for conveying the article through the tank and supporting the article inclined in one direction at one portion of the tank and inclined in the opposite direction at another portion of the tank, said means being adapted to raise each end of the article above the liquid during a portion of its travel.

15. In apparatus for treating pipes, bars and the like, the combination with a tank adapted to contain a liquid, of means for conveying the articles through said tank and comprising means for alternately inclining the articles in opposite directions during their travel through said tank.

16. In apparatus for treating pipes, bars and the like, the combination with a tank adapted to contain a liquid, of means for conveying the articles through said tank and comprising means for alternately inclining the articles in opposite directions during their travel through said tank, and alternately raising opposite ends of the articles above the surface of the liquid in said tank.

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